Governor's STEM Academy Brief

VIRGINIA DEPARTMENT OF EDUCATION

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The purpose of the monthly brief is to provide information, resources, and a networking vehicle to support the STEM (science, technology, engineering, and mathematics) Academies in Virginia.

GOVERNOR'S STEM ACADEMIES SPOTLIGHTS

The Heritage High School Governor's STEM Academy (Newport News Public Schools) will offer a three-week "STEMulating Minds" summer program July 13–30, 2015, for rising ninth graders. Patterned after their successful 2014 project of designing an energy efficient dream home, the 2015 project theme will focus on the Grand Challenges of Engineering and how to solve real-world problems while concentrating on SeaPerch (underwater robotics), Environmental Science, Video Game Design, and Computer Systems Technology.

CAREER LINKS—MANUFACTURING; ARCHITECTURE AND CONSTRUCTION

- To explore manufacturing prospects, see 2014 Manufacturing Skills & Training Study and 2015 Skills Gap Report from the Manufacturing Institute**.** Other career resources include Dream It. Do It. Virginia.; Manufacturing is Cool!; Military2Manufacturing; Workforce: Skills Certifications; Careers in Welding; Women in Welding; The Future of Female Talent in the Manufacturing Sector; NNIN Nanotechnology Careers; Careers in Mining; Learn About Robotics; and Dream Up the Future.

- To explore occupational options in architecture and construction, visit sites such as the following: Recruiter: Architecture and Construction Careers; College and Career Readiness: Architecture and Construction; Glencoe Career Education: Architecture and Construction; U.S. News: Best Construction Jobs; Build Your Future: Careers in Construction; and Join the Seabees & Launch a Career in Navy Construction.

- Architecture and construction career videos are available at CareerOneStop.

- Green building practices and sustainability in construction are the focus of many sites, such as Earthcraft House Virginia; EPA: Green Building; 10 Cutting-edge, Energy-efficient Building Materials; Sustainable Build; Construction Management Maximizes Sustainability; EcoGreen Hotel; and Designing Green Hospitals of the Future.

- Safety and security in the construction industry are highlighted in The Best Practices for Construction Safety; WorkplaceSafetyExperts: Safety Guide; The Constructor: Best Practices in Construction; OSHA Worker Safety Series: Construction; Company Culture to Blame for Workplace Hazards; Whole Building Design Guide: Cybersecurity; Building Automation (5-part discussion of cybersecurity and building automation systems); and Providing Remote Access Connections for Building Services Projects.

GRANTS AND OPPORTUNITIES

- An overview of competitive events provides information and opportunities for Technology Student Association (TSA) members to exhibit skills in architecture, construction, and manufacturing.

- For manufacturing prospects in 2015 and other industry news, visit MemberFocus, the online magazine of The National Association of Manufacturers.

- For resources on the Internet of Things and its impact on architecture and construction, visit How the Internet of Things (IoT) Will Transform Construction Equipment; How the Internet of Things Is Transforming Construction; Asset Management, Time Tracking and the Internet of Things; and Building with the Internet of Things in the Construction Industry.

- For robotics resources, visit sites such as Carnegie Mellon University: Research at the Robotics Institute; IEEE Spectrum: Robotics; gizmag: Robotics; Science: Robots; and NASA: The Robotics Alliance Project (see also The Robotics Alliance Project Grades 9th to 12th and Educational Robotics Matrix).

INSTRUCTIONAL STRATEGIES

- Potential resources for classroom instruction on sustainable manufacturing are available at EPA: Sustainable Manufacturing; OECD Sustainable Manufacturing Tool Kit; Sustainable Plant; Sustainability: Environmental Management & Responsible Manufacturing; E3 Tools; Manufacturing Institute: Facts About the Environmental Impact of Manufacturing; and Remanufacturing Key to Sustainable Supply Chains.

- Lesson plans for manufacturing and welding themes include Seasonal Manufacturing; New Manufacturing Alliance; Made in Florida: Industry Based Lesson Plans; Manufacture Your Future; Teachers TryScience; Engaging Students in Engineering; IEEE Lesson Plans; Critical Thinking and Problem Solving in Advanced Manufacturing; Manufacturing: Gas Metal Arc Welding (GMAW) Shielding GasMix; TIG Welder (includes videos); and ETT Workshop Project—Crank Power Transfer Device.

- Among teaching materials for nanotechnology are Introduction to Nano Video; What is Nanotechnology (video); Nanotechnology Devices in the Future (video); TryNano.org; NANO.gov; MRSEC Education Group: Nanotechnology; Nanotechnology Lesson Plans; and nanowerk.com.

- Visit the Minerals Education Coalition site for classroom units and videos on the mining of copper, molybdenum, and iron and their uses in manufacturing, as well as resources on the science of minerals and Minerals in Your Life.

- Adaptable teaching resources for architecture and design include Mathematics & Architecture: Resources; Discover Design: A Student Design Experience; MC3: Math in CTE Lesson Plans—Architecture & Construction; The Skyscraper Museum; Office Architecture Design; Technology Integration into Architecture Building Systems; PBCL in an Architecture Design Class; Baltimorphosis; Interior Design; Architectural Design; and About Home: Top 10 Free Lesson Plans & Activities: Architecture.

- Among the many construction-related classroom resources available are Construction Math Toolbox; Alabama Learning Exchange: Construction Lesson Plans; Energy 101: Energy Efficient Commercial Buildings; Concrete in the Classroom; The Constructor: Civil Engineering Home; How is Electricity Generated?; What is Electricity?; Architecture and Construction: Stair Construction; GGRAM Masonry Lessons; Carpentry Lesson Plans; and Construction Management.

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